MTL25

MUSTANG
TRACK LOADER

SERVICE MANUAL

PART #908313

Revision C - 06/11

Mustang Manufacturing Company, Inc.

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SAFETY PRECAUTIONS

SAFETY ALERT SYMBOL

This symbol means Attention! Be Alert! Your Safety Is Involved.
The message that follows the symbol contains important information about safety.
Read and understand the message to avoid personal injury or death.

■ SIGNAL WORDS

Safety messages appearing in this manual and on machine decals are identified by the words "DANGER", "WARNING" and "CAUTION". These signal words mean the following:

⚠ DANGER	⚠ WARNING	⚠ CAUTION
The word "DANGER" indicates an imminently hazardous situation which, if not avoided, can result in serious injury or death.	The word "WARNING" indicates a potentially hazardous situation which, if not avoided, could result in serious injury or death.	The word "CAUTION" indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury.

IMPORTANT: The word "IMPORTANT" is used to alert against operators and maintenance personnel about situations which can result in possible damage to the machine and its components.

This manual is intended for trained and qualified personnel only. Warnings or cautions described in this manual do not necessarily cover all safety measures. For maintenance work, each person must take adequate safety precautions against possible hazards present in the respective working environment.

Observe all safety rules

- Operation, inspection and maintenance of this machine must be performed only by a trained and qualified person.
- All rules, regulations, precautions and safety procedures must be understood and followed when performing operation, inspection and maintenance of this machine.
- Do not perform any operation, inspection and maintenance of this machine when under the adverse influence of alcohol, drugs, medication, fatigue, or insufficient sleep.

Wear appropriate clothing and personal protective equipment

- Do not wear loose clothing or any accessory that can catch on controls or in moving parts.
- Do not wear oily or fuel stained clothing that can catch fire.


E3A040

- Wear a hard hat, safety shoes, safety glasses, filter mask, heavy gloves, ear protection and other protective equipment as required by job conditions. Wear required appropriate equipment such as safety glasses and filter mask when using grinders, hammers or compressed air, as metal fragments or other objects can fly and cause serious injury.
- Use hearing protection when operating the machine. Loud prolonged noise can cause hearing impairments, even the total loss of hearing.

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SPECIFICATION TABLES

SPECIFICATIONS

Serial Number		21500004~		
Type		Canopy		
Standard Bucket Capacity				
Rated Capacity	m^3	0.579		
Struck Capacity	m^3	0.426		
Machine Mass (not including operator)	kg	4775		
Dimensions		21500004~21500131	21500132~21500627	21500628~
Overall Lenght: with bucket	mm	3930	3955	3985
without bucket	mm	3085	3105	3135
Overall Width: with bucket	mm	1960		
without bucket	mm	1860		
		21500004~21500749	21500750~21501329	21501330~
Overall Height	mm	2215	2320	2215
Minimum Ground Clearance	mm	345		
Front Clearance Radius: with bucket	mm	2435		
without bucket	mm	1560		
		21500004~21500627		21500628~
Rear Clearance Radius	mm	1745		1755
Overall Width of Crawler	mm	1860		
Overall Length of Crawler	mm	2155		
Bucket Width	mm	1960		
Angle of Departure	degree	30		
Working Range				
Maximum Lift Height to Bucket Pin	mm	3205		
Maximum Dumping Height	mm	2430		
Maximum Dump Angle Fully Raised	degree	39		
Maximum Bucket Rollback at Ground Level	degree	31		
Reach Fully Raised	mm	985		
Performance				
Breakout Force	kN	38.5		
Travel Speed 1st/2nd	km/h	8.1/11.1		
Gradeability	degree	30		
Ground Pressure	kPa	29.7		
Tipping Load	kg	3200		
Cycle Time				
Raise-Full Load (Lift Arm)	Sec.	4.8		
Lower-No Load (Lift Arm)	Sec.	3.1		
Dump-Full Load (Bucket)	Sec.	3.3		
Curl-Full Load (Bucket)	Sec.	2.4		

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RECOMMENDED LUBRICANTS

Use different fuels, lubricants and greases according to the temperature, referring to the chart below.

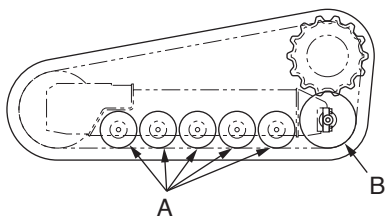
- Change the lubricant earlier than as show in the table if it is extremely dirty or its performance has deteriorated severely.
- Whenever possible, use the same brand of lubricant as before. If changing with a different brand, replace the entire quantity – do not mix different brands.

Part	Type	Type by temperature -22 -4 14 32 50 68 86 104°F -30 -20 -10 0 10 20 30 40°C	Replacement interval	Capacity
Engine oil pan	Diesel engine oil API service CD	SAE 5W-20 SAE 10W-30 SAE 15W-40	After first 50 hrs. Every 250 hrs.	Upper limit: 14 L Lower limit: 7 L
Hydlaulic tank	Diesel engine oil API service CD	SAE 10W-30	Every 1000 hrs.	Total system: 95 L Tank level 64: L
Fuel tank	Diesel fuel	Use a clean, Quality fuel for performance and optimum engine life. • To prevent fuel flow problems in cold weather, use diesel fuel with a pour point of at least -12°C (10°F) below the lowest expected ambient temperature. • Minimum cetane number is 45. Low temperature or high altitude operation may require the use of fuel with a higher cetane number.		Tank level: 108 L
Engine cooling system	Coolant (water**+Coolant***)	30% coolant mixture 50% coolant mixture	Every 1000 hours	15 L
Travel reduction gear	Gear oil API-GL-4	SAE 90	After first 250 hrs.* Every 500 hrs.	1.8 L
Track Roller A	Diesel engine oil API service CD	SAE 30	—	180 mL
Track Roller B	Mobil gear SHC 680	——	—	170 mL
Idler		——	—	170 mL
Working equipment	Lithium grease EP-2 NLGI No. 2	——	Daily or erery 10 hrs.	As required
Levers		——	When required	

* If the percentage of the traveling time within the total operating time is high, replace the gear oil earlier than the specified time.

** For water, use tap water (soft). Do not use well or river water.

*** When the ambient temperature drops below 0°C, add coolant (antifreeze). Follow the coolant manufacture's instructions to determine the mixture ratio.



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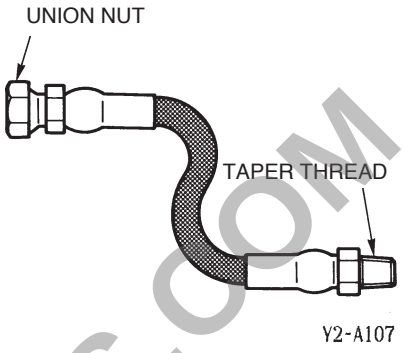
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TIGHTENING TORQUES

Hydraulic Hoses

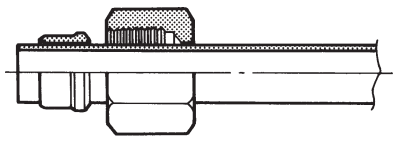
Hose Fitting Size	Torque			
	Union Nut (G)		Taper Thread (R)	
	N·m	ft-lb	N·m	ft-lb
1/8	9.8 $^{+4.9}_{0}$	7.3 $^{+3.5}_{0}$	11.8 ±1.2	8.7 ±0.8
1/4	24.5 $^{+4.9}_{0}$	18.1 $^{+3.5}_{0}$	29.4 ±2.9	21.7 ±2.1
3/8	49 $^{+4.9}_{0}$	36.2 $^{+3.5}_{0}$	53.9 ±5.4	39.8 ±3.9
1/2	58.8 $^{+4.9}_{0}$	43.4 $^{+3.5}_{0}$	88.3 ±8.8	65.1 ±6.4
3/4	117.7 $^{+4.9}_{0}$	86.8 $^{+3.5}_{0}$	147.1 ±14.7	108.5 ±10.7
1	137.3 $^{+4.9}_{0}$	101.3 $^{+3.5}_{0}$	196.1 ±19.6	144.7 ±14.3



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Bite Type Pipe Fitting for Steel Pipe

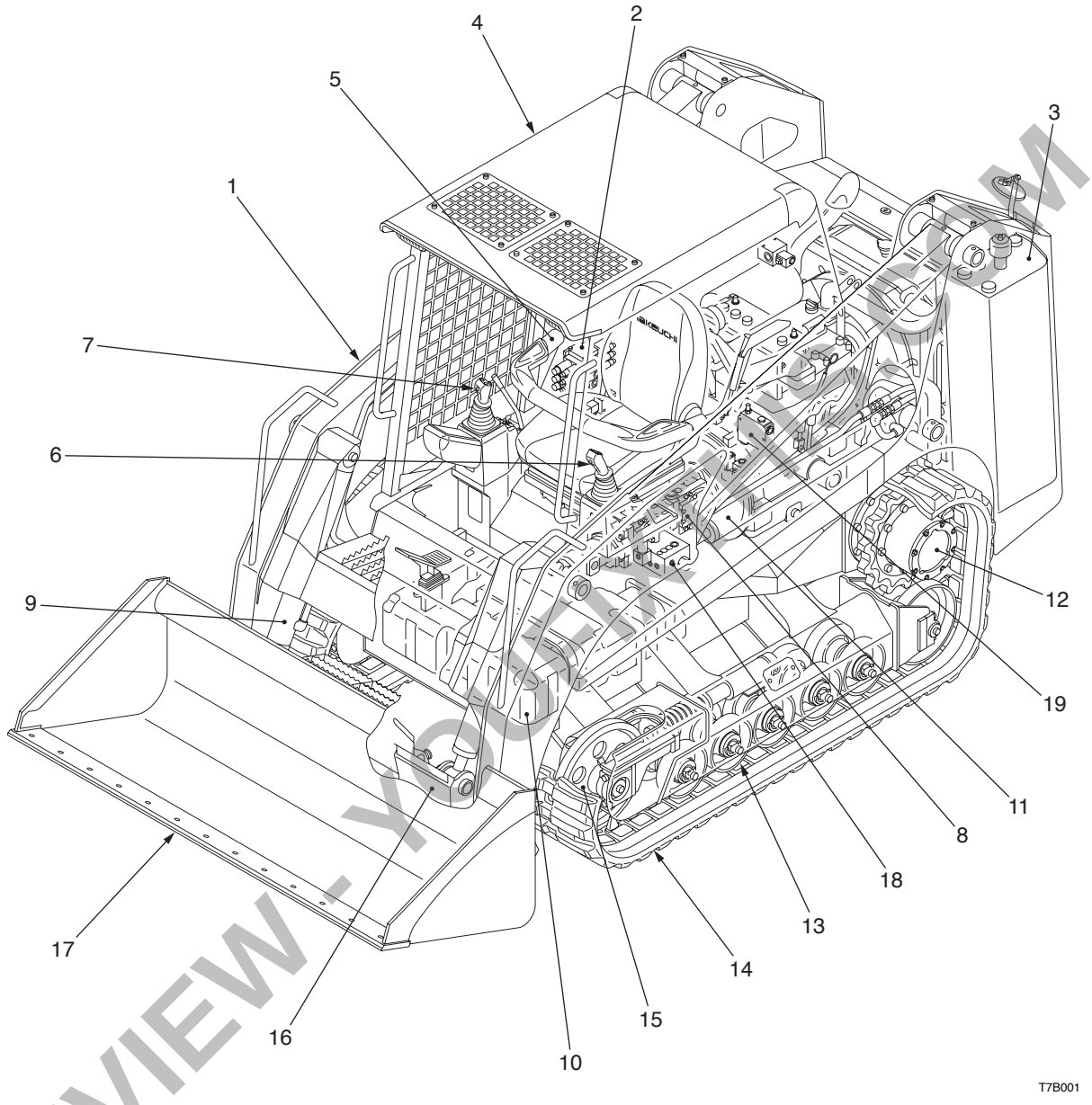
Pipe Outer Diameter (mm)	Torque	
	N·m	ft-lb
8	34.3 ±4.9	25.3 ±3.5
10	41.7 ±2.5	30.7 ±1.7
12	58.8 ±4.9	43.4 ±3.5
15	88.3 ±4.9	65.1 ±3.5
16	93.2 ±4.9	68.7 ±3.5
18	132.4 ±4.9	97.6 ±3.5
22	205.9 ±9.8	151.8 ±7.2
27.2	245.2 ±9.8	181.0 ±7.2
28	313.8 ±19.6	231.4 ±14.3
32	313.8 ±19.6	231.4 ±14.3
35	411.9 ±19.6	303.7 ±14.3


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NAMES OF COMPONENTS



1. Lift Arm
2. Control Valve
3. Hydraulic Tank
4. Canopy
5. Safety Bar
6. Pilot Valve (L. H.)
7. Pilot Valve (R. H.)
8. HST Pump
9. Bucket Cylinder
10. Fuel Tank
11. Arm Cylinder
12. Travel Motor
13. Track Roller
14. Crawler Belt
15. Idler
16. Quick Attachment
17. Bucket
18. Control Valve (Sub)
19. Self -Level Valve

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DISASSEMBLY AND ASSEMBLY

Removing the Engine

1. Disconnect the negative battery cable from the battery.

2. Remove the canopy.
   ☞ "Removing the Canopy"

3. Remove the floor frame.
   ☞ "Removing the Floor Frame"

4. Disconnect the electrical wiring from the air cleaner. Next, remove the bracket (1) together with the air cleaner.

5. Remove the radiator.
   ☞ "Removing the Radiator"

6. Disconnect the coolant drain hose (2).

7. Remove the hydraulic pump.
   ☞ "Removing the Hydraulic Pump"

8. Remove the valves (3) and the filter (4).

9. Remove the fuel inlet pipe (5).

10. Disconnect the fuel hoses (6).

11. Disconnect the battery cable (7) and all the connections on the engine side of the electric wirings (8).
    - Attach identification labels to individual wirings.
    - Disconnect the wirings from the clamp and the band.

12. Disconnect the engine ground cable (9).

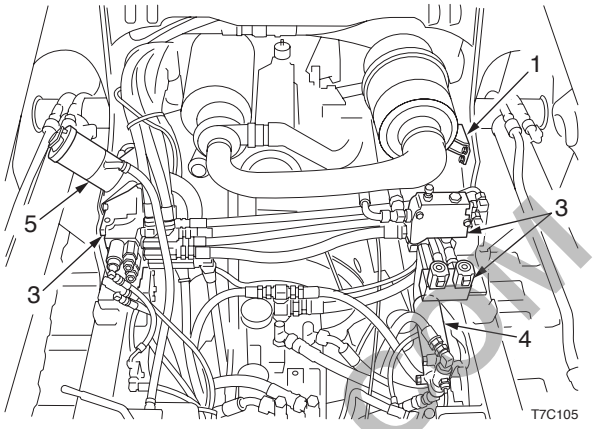
13. Remove the bracket (10) and accelerator wire (11) from the engine.

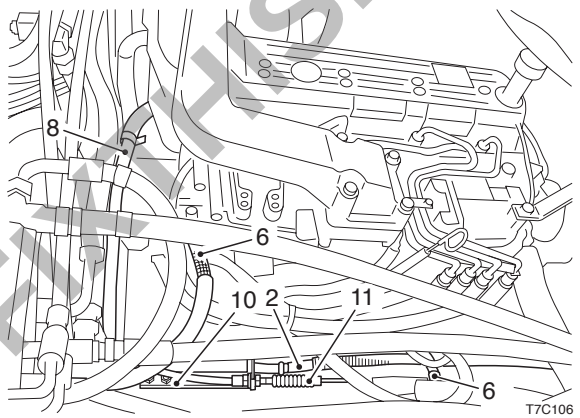
14. Remove the bolts (12) and then the cushion rubbers.
    ⊂⊃ Bolt: 256N·m; Apply thread-locking compound.

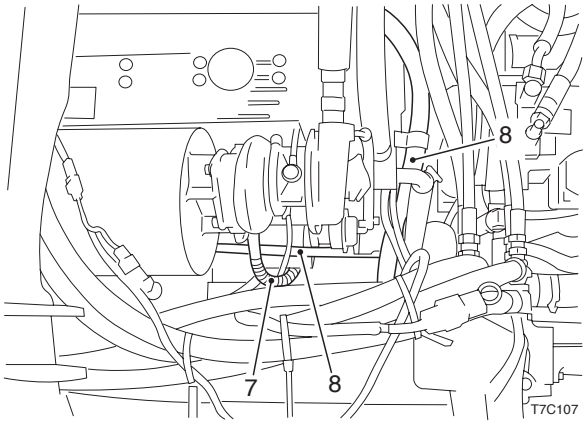
15. Suspend the engine temporarily, and remove the engine.
    ⏢ Engine: 340 kg

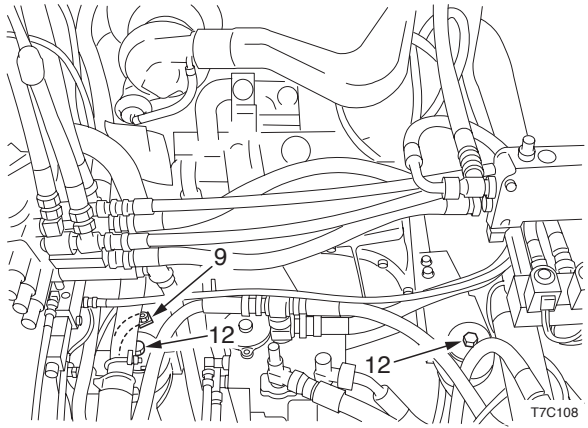
Installing the Engine

Follow the same procedure as for removal in the reverse order.









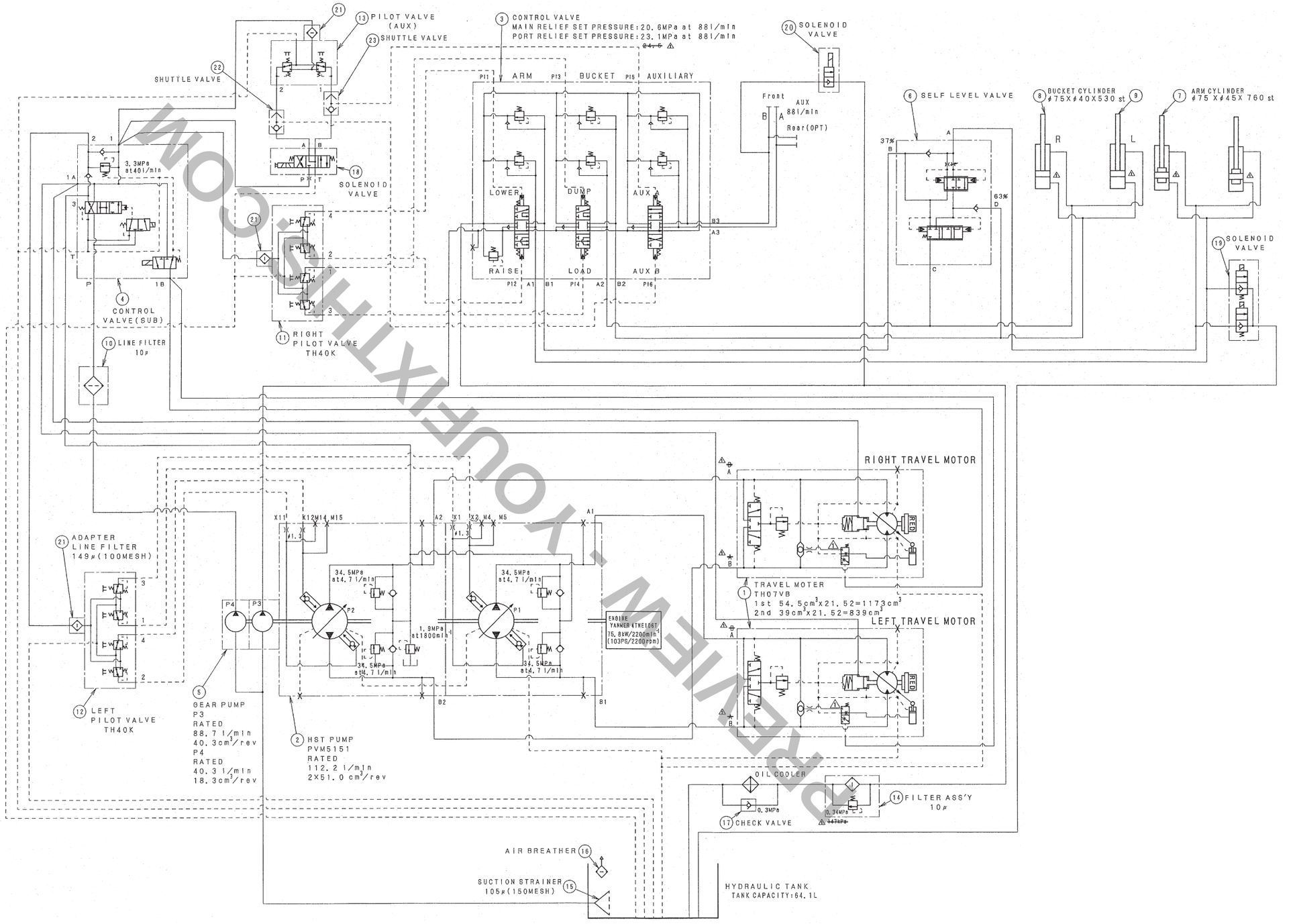
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HYDRAULIC SYSTEM

HYDRAULIC CIRCUIT DIAGRAM

Standard
Serial No. 21500004~21500627



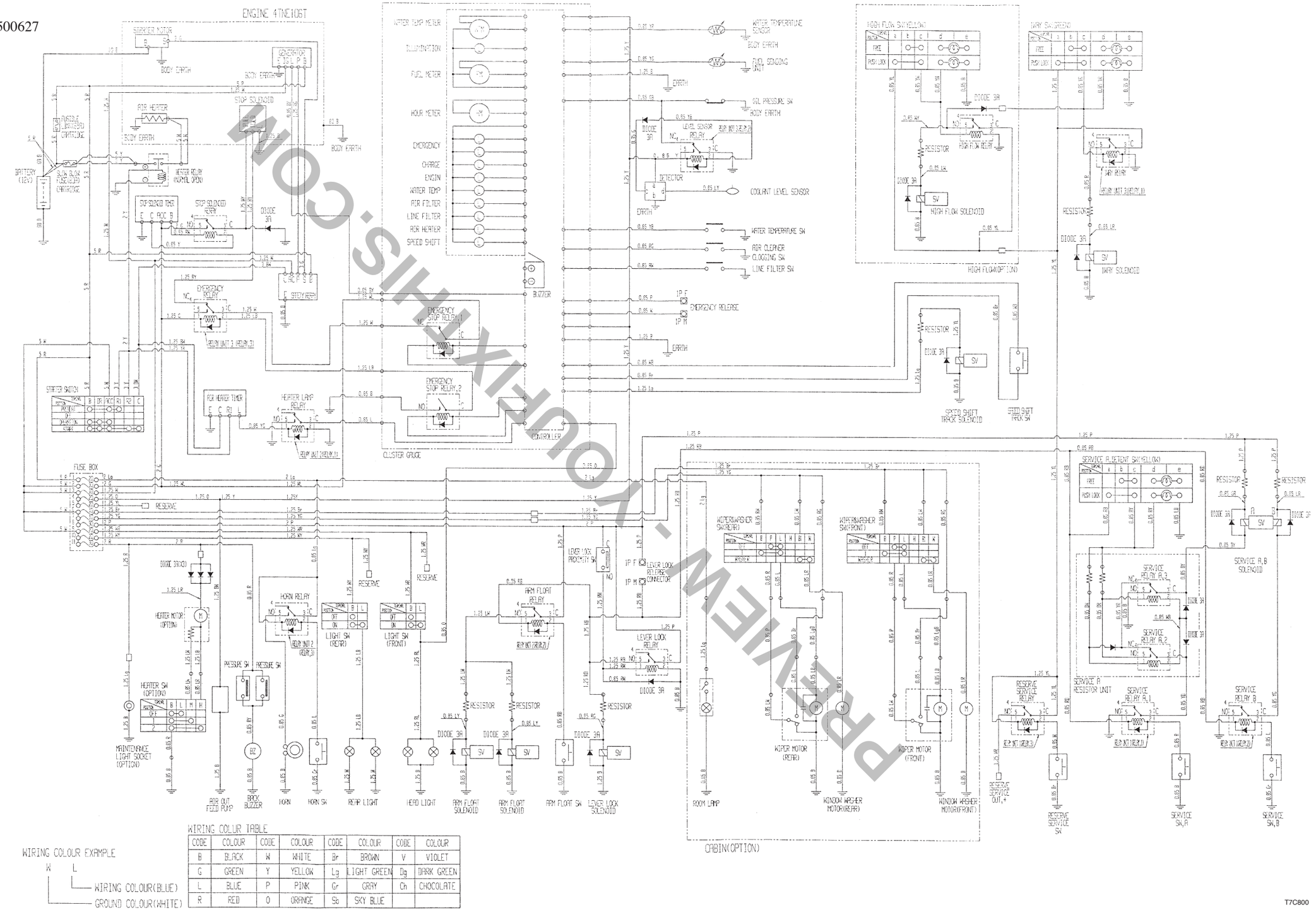
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ELECTRICAL SYSTEM

ELECTRICAL WIRING DIAGRAM

Serial No. 21500004~21500627



WIRING COLUR TABLE

CODE	COLOUR	CODE	COLOUR	CODE	COLOUR	CODE	COLOUR
B	BLACK	W	WHITE	Br	BROWN	V	VIOLET
G	GREEN	Y	YELLOW	Lg	LIGHT GREEN	Dg	DARK GREEN
L	BLUE	P	PINK	Gr	GRAY	Ch	CHOCOLATE
R	RED	O	ORANGE	Sb	SKY BLUE		

WIRING COLOUR EXAMPLE

W L
- L — WIRING COLOUR(BLUE)
- W — GROUND COLOUR(WHITE)

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Figure 7-9 Preventive Maintenance Schedule.

PREVENTIVE MAINTENANCE SCHEDULE FOR AIR CONDITIONING SYSTEMS

NOTE: Typical Maintenance Schedule: 3 months or 15,000 miles, 6 Months or 30,000 miles, 12 Months or 60,000 miles

Installation Date: _____ Mileage: _____

Last Maintenance Check: _____ Mileage: _____

Checked by _____ Mileage: _____

COMPONENT	MAINTENANCE INTERVAL (months) 3*	6*	12*	DONE
1. COMPRESSOR				
Check noise level	•			❑
Check clutch pulley	•			❑
Check oil level	•			❑
Run system 5 minutes	•			❑
Check belts for tension (120 lb max.)	•			❑
Inspect shaft seal (leakage)		•		❑
Check mounting bracket (tighten bolts)		•		❑
Check alignment to clutch w/crankshaft drive pulley		•		❑
Perform manifold gauge check			•	❑
Verify clutch is engaging			•	❑
CONDENSER				
2. Clean dirt/bugs/leaves from coils (w/compressed air)	•			❑
Check inlet/outlet for obstructions/damage	•			❑
RECEIVER-DRIER				
3. Check inlet line from condenser (hot to touch)	•			❑
Check sight glass (streaks or cloudiness)	•			❑
Replace if system is opened			•	❑

COMPONENT	MAINTENANCE INTERVAL (months) 3*	6*	12*	DONE
4. EXPANSION VALVE				
Inspect capillary tube (leakage/damage/looseness)			•	❑
5. EVAPORATOR				
Clean dirt/bugs/leaves form fins/tubes (w/compressed air)			•	❑
Check solder joints on inlet/outlet tubes (leakage)			•	❑
Inspect condensate drain (R-12 or oil leak)			•	❑
6. OTHER COMPONENTS				
Check discharge lines (hot to touch)	•			❑
Check suction lines (cold to touch)	•			❑
Inspect fittings/clamps/hoses		•		❑
Check thermostatic switch (proper operation)			•	❑
Outlets in cab (temperature check; 40 to 50°F)		•		❑
Check fan clutch (proper operation)		•		❑
Inspect all wiring connections		•		❑
Operate manual controls through full functions	•			❑

The following require monthly maintenance:

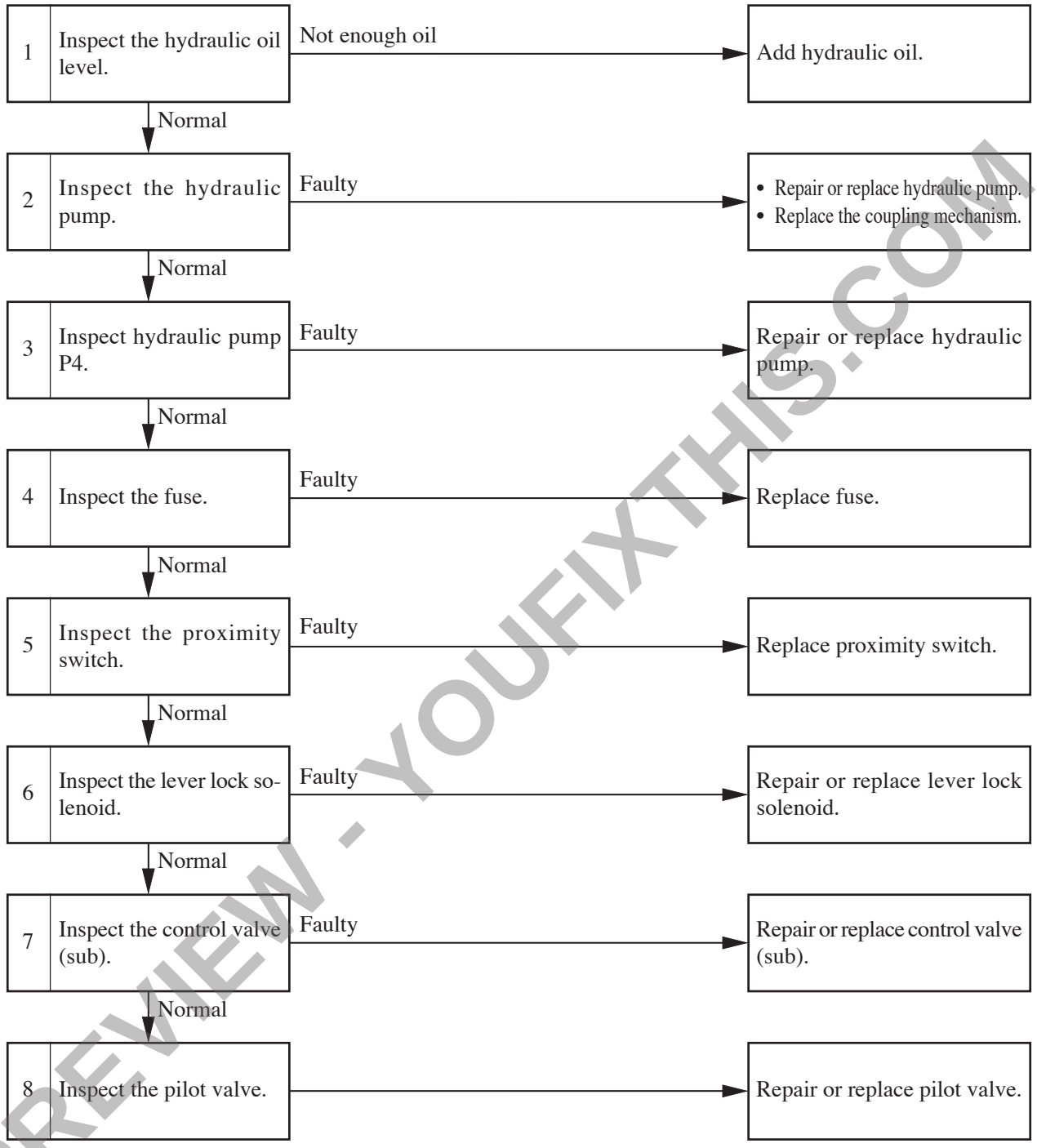
*Compressor – run system at least 5 minutes (40 degrees Fahrenheit minimum outside temp.) in order to circulate oil and lubricate components.

Maintenance notes: _____

_____

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COMPLETE FAILURE OF ALL SYSTEMS.



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FOREWORD

This manual is intended for persons who engage in maintenance operations, and explains procedures for disassembly and reassembly of the machine, check and maintenance procedures, maintenance reference values, troubleshooting and outline specifications, etc. Please use this manual as a reference in service activities to improve maintenance techniques.
Further, please be advised that items contained in this manual are subject to change without notice due to design modifications, etc.

MACHINE FRONT AND REAR, LEFT AND RIGHT

The end where the bucket is mounted is the front and the end with the travel motors is the rear. Also the right and left sides of the operator when he is seated in the driver's seat are the right and left sides of the machine.

MACHINE SERIAL NUMBER

The machine serial number is stamped on the identification plate. When sending reports and inquiries, and when ordering parts, etc., be sure to include this number.

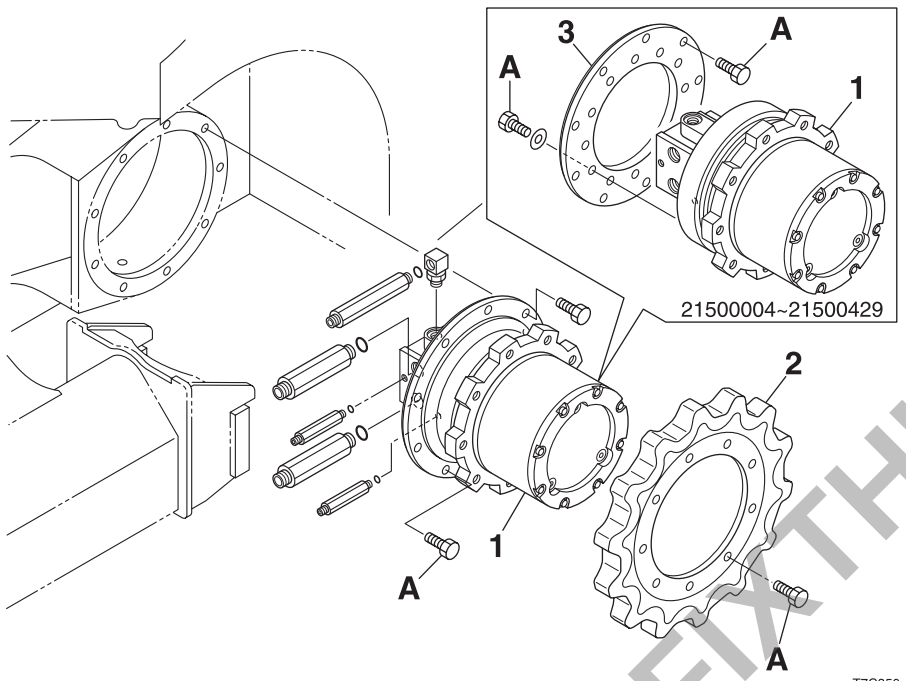
MANUAL CONTROL

Information on those to whom this manual is distributed is recorded in the ledger in the section in charge at this company, so please decide on a person to be in charge of it and control it. When there are updates or additions, etc., we will notify the person in charge.

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Travel Motor



1. Travel Motor
2. Sprocket
3. Ring

A: 241 N·m; Apply thread-locking compound.

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Overview of System Operation

Click on any of these subject headings to go directly to the page

- Truck and Heavy Equipment Systems
- Air Conditioner-System Operation
- Heater System Operation
- Environmental Effects on System Operation
- Chapter Review

Truck and Heavy Equipment Systems

A variety of HVAC systems are in use today, some old and some new. There are:

- Vehicle manufacturer installed systems
- Owner specified systems
- Add-on systems
- Retrofit systems

The system components come in different colors, shapes, and sizes. They may be mounted in or on the cab in varied locations. Owners or fleet maintenance people can modify systems by adding controls, auxiliary units or ducts. Major components are sometimes replaced due to damage or failure. All systems were, at least originally, designed and installed to meet the needs of an operator. Figure 2-1 includes illustrations of various AC and Heater systems. They illustrate system advantages and disadvantages explained in the paragraphs that follow.

The HVAC system includes both heater and air conditioner components, usually a common control, and air ducts. The system cools the cab by removing heat energy. It removes moisture from damp air in the cab and adds fresh outside air to the cab. In this way, the operator can work comfortably in all kinds of weather.

A sleeper unit, built in or added on, increases the air volumes in the cab. The air conditioner or heater must circulate and cool or heat a larger amount of air. This is accomplished by routing ducts and controls to the sleeper compartment as part of system design. Components may be increased in size to handle the larger cab air volume. A bigger heater core, air conditioning evaporator coil, condenser, blower or fan may be included. Often, on long haul trucks, auxiliary air conditioning and heater components and controls are added. The objective remains the same, to move heat energy and maintain occupant comfort.

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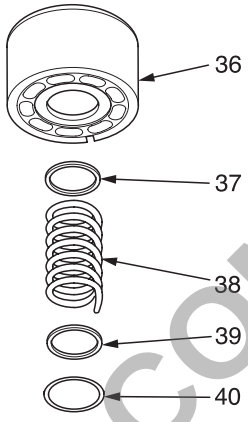
21. Disassemble the cylinder block.

⚠WARNING

Always wear appropriate protective items such as safety goggles, as component parts can jump out and cause serious bodily injury.

Do not disassemble the cylinder block unless required.

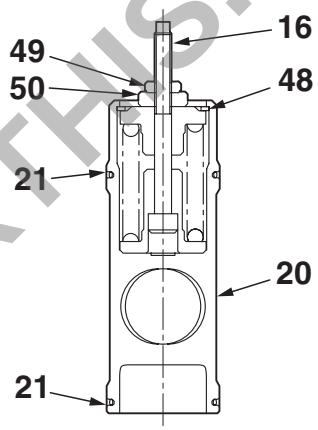
a. Remove the retaining ring (40) while compressing the spring.
b. Remove the washer (39), the spring (38) and the washer (37) from the cylinder block (36).



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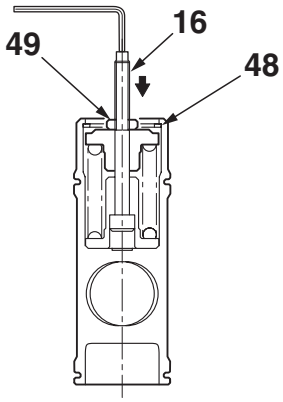
22. Disassemble the servo piston.
The servo piston should not be disassembled unless required for cleaning up foreign matter or replacing damaged components.

a. Remove the piston rings (21) from the servo piston (20).
b. Remove the nuts (49 and 50) from the tie bolt (16).



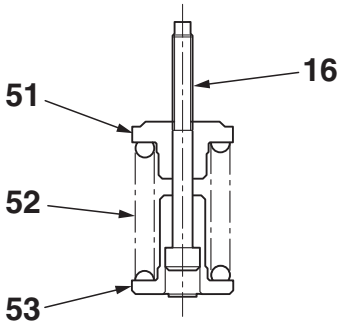
S3F318

c. Attach the nut (49) to the tie bolt (16), and tighten the nut (49) manually to compress the spring.
   - Hold the tie bolt by an cap wrench to prevent it from turning.
   - Tighten the nut until no load is applied to the snap ring (48).
d. Remove the snap ring (48).
e. Remove the spring assembly.
f. Remove the nut (49).



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g. Remove the spring guide (51), the spring (52), and the spring guide (53) from the tie bolt (16).

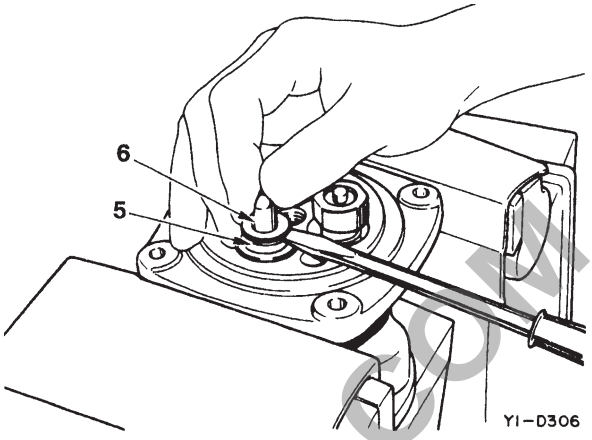


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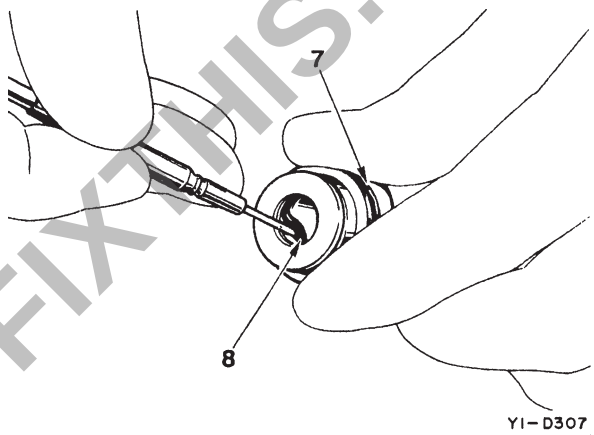
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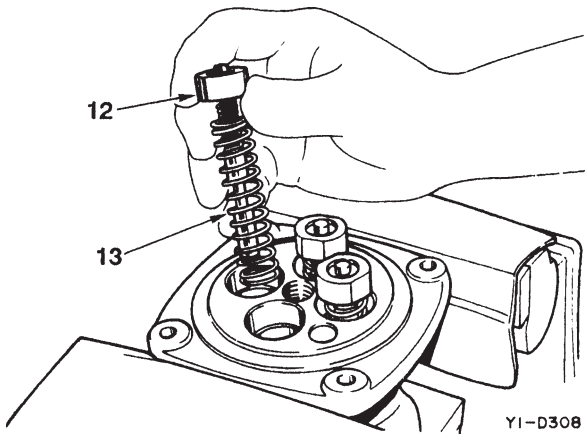
3. Take out the plug (5) then remove the push rod (6) from the plug (5).
   - If the plug is difficult to remove, use (–) screw driver to remove it.
   - Be careful not to let the plug fly out from the spring's force.



4. Remove the O-ring (7) and seal (8) from the plug.



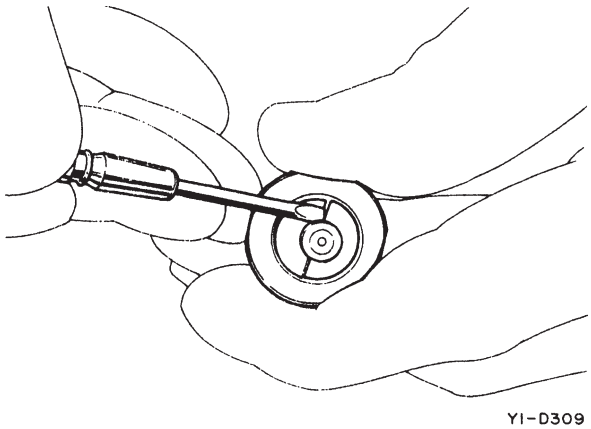
5. Remove the reducing valve (12) and spring (13).
   - Make match marks on the reducing valve and casing hole so they can be placed in the same position when they are reassembled.



6. Disassembled the reducing valve.

S/N 21400004~21503485

   a. Remove washer 1.
      - Stand the valve on a flat work bench with the bottom of the spool down, then push the spring seat down. (It cannot be pushed down more than 6 mm.)



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1. Inspect the hydraulic oil level.
   ☞ "III. Machine Configuration, Hydraulic Tank"

2. Hydraulic pump is emitting an unusual level of noise.
   The cause of the problem is probably a fault in the suction line which has caused the pump to dry out. Check according to the following procedure.
   a. Check the lines sucking the hydraulic oil.
      • Apply grease or oil to the area which seems to be the cause of the problem and watch to see what happens. (Check to see if air is being drawn into the system.)
   b. Check to see if the suction strainer is clogged.

3. Inspect the line filter.
   Remove the case, take out the filter element and check to see if the filter is clogged.

4. Inspect the control valve (sub).
   ☞ "V-6"

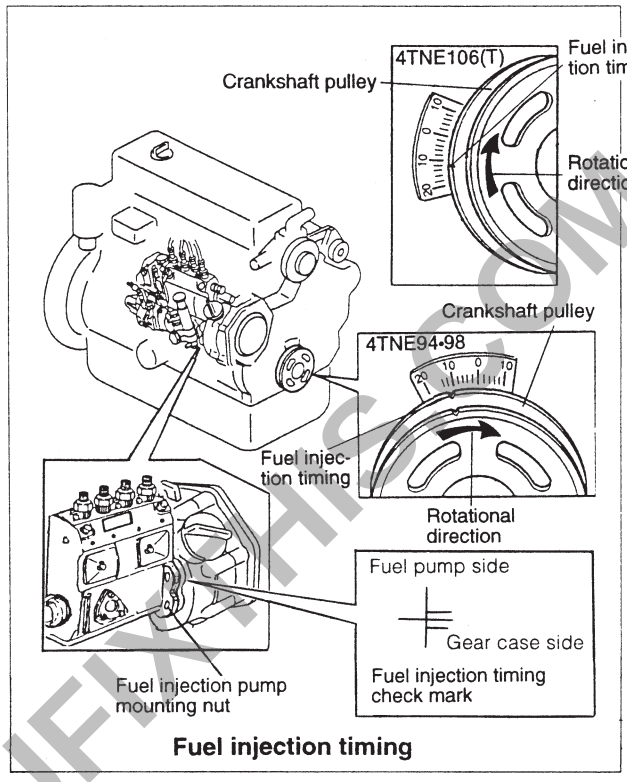
5. Hydraulic pump at fault.
   When the inside of the pump is excessively worn or has been damaged, the possibility exists that metal filings will work their way into the hydraulic oil. If this is the case, take the following action:
   • Replace the line filter and spin filter element.
   • Replace or flush the hydraulic oil (any oil of NAS Grade 9 or above may be used).
   • When replacing the hydraulic oil, always be sure to clean the inside of the hydraulic tank and the suction strainer.
   ☞ "III. Machine Configuration, Hydraulic Tank"
   If the pump seal has been damaged, replace it.
   ☞ "IV. Hydraulic Units, Hydraulic Pump"

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3.7 Fuel Injection Timing Inspection and Adjustment

1) Set the engine ready for starting. (Complete air bleeding from the fuel line.)
2) See that the fuel injection timing check mark on the fuel pump mounting flange and gear case are aligned.
3) Set the control valve at the operating position.
4) Disconnect the high pressure tube for the No.1 cylinder on the fuel pump side. (Do not remove the delivery valve.)
5) Check fuel discharge from the delivery holder while turning the crankshaft (clockwise as seen from the radiator), and stop turning it when the fuel comes out.
6) Check the crankshaft pullet top mark position on the timing scale. The No.1 piston can be checked at its top dead center when the position is between 10° before the top (10 graduations on the left from 0) and 10° after the top.



Fuel injection timing

7) Then wipe the outlet of the delivery holder clean. Turn the crankshaft in the opposite direction to return to approx. 20° before the top.
8) Slowly turn the crankshaft clockwise. As the oil surface in the deliver holder rises, stop rotation upon rising and check the position on the timing scale. The injection timing is normal if the top mark is positioned in the timing scale range shown in the table below on the left side from 0.

	4TNE94•98	4TNE106	4TNE106T
Standard: Degrees bTDC (FID)	10~12	13~15	11~13

9) Repeat steps 6) to 8) a few times.

(Note)
Injection timing check for one cylinder is generally sufficient. If it is to be checked for all four cylinders, turn the crankshaft 180° each time and check in the order of cylinders No.1, No.3, No.4, No.2 and No.1. (The No.1 cylinder is positioned furthest from the radiator.)
The cylinder to be checked is not limited to the No.1 cylinder but any desired one may be checked.

10) If the ignition timing is outside the standard, loosen the fuel pump mounting nut and rotate the fuel pump toward or away from the engine for adjustment. Rotate toward the engine to advance the timing, and away from the engine to delay the timing.
(One graduation on the gear case scale corresponds to one degree in ignition timing.)

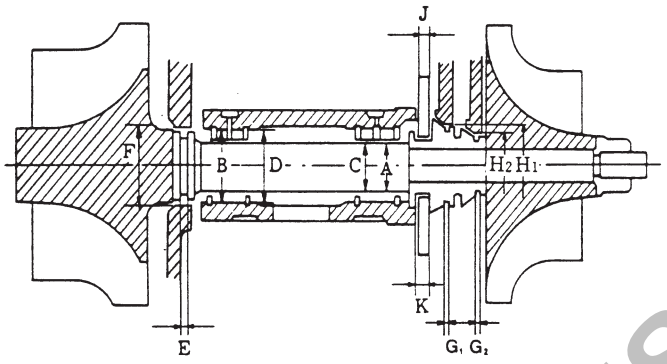
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8.2 Service Standards

(1) Service standards



Unit ; mm

		Standard dimension	Wear limit
Turbine shaft	Turbine shaft journal outside diameter (A)	7.99 to 8.00	7.98
	Turbine shaft seal ring groove width (E)	1.25 to 1.28	1.29
	Compressor side seal ring groove width (G_1)	1.22 to 1.23	1.31
	Compessor side seal ring groove width (G_2)	1.02 to 1.03	1.11
	Turbine shaft runout	0.002	0.011
Bearing	Journal bearing inside diameter (C)	8.01 to 8.03	8.04
	Journal bearing ouside diameter (D)	12.32 to 12.33	12.31
	Bearing housing inside diameter (B)	12.40 to 12.41	12.42
Thrust bearing	Thrust bearing width (J)	3.99 to 4.01	3.98
	Thrust bushing groove dimension (K)	4.04 to 4.05	4.07
Seal ring fixing area	Turbine side (bearing housing) (F)	15.00 to 15.02	15.05
	Compressor side (seal ring) (H_1)	12.40 to 12.42	12.45
	Compressor side (seal ring) (H_2)	10.00 to 10.02	10.05
Rotor play in axial direction		0.03 to 0.06	0.09
Rotor play in radial direction		0.08 to 0.13	0.17

(2) Tightening torque

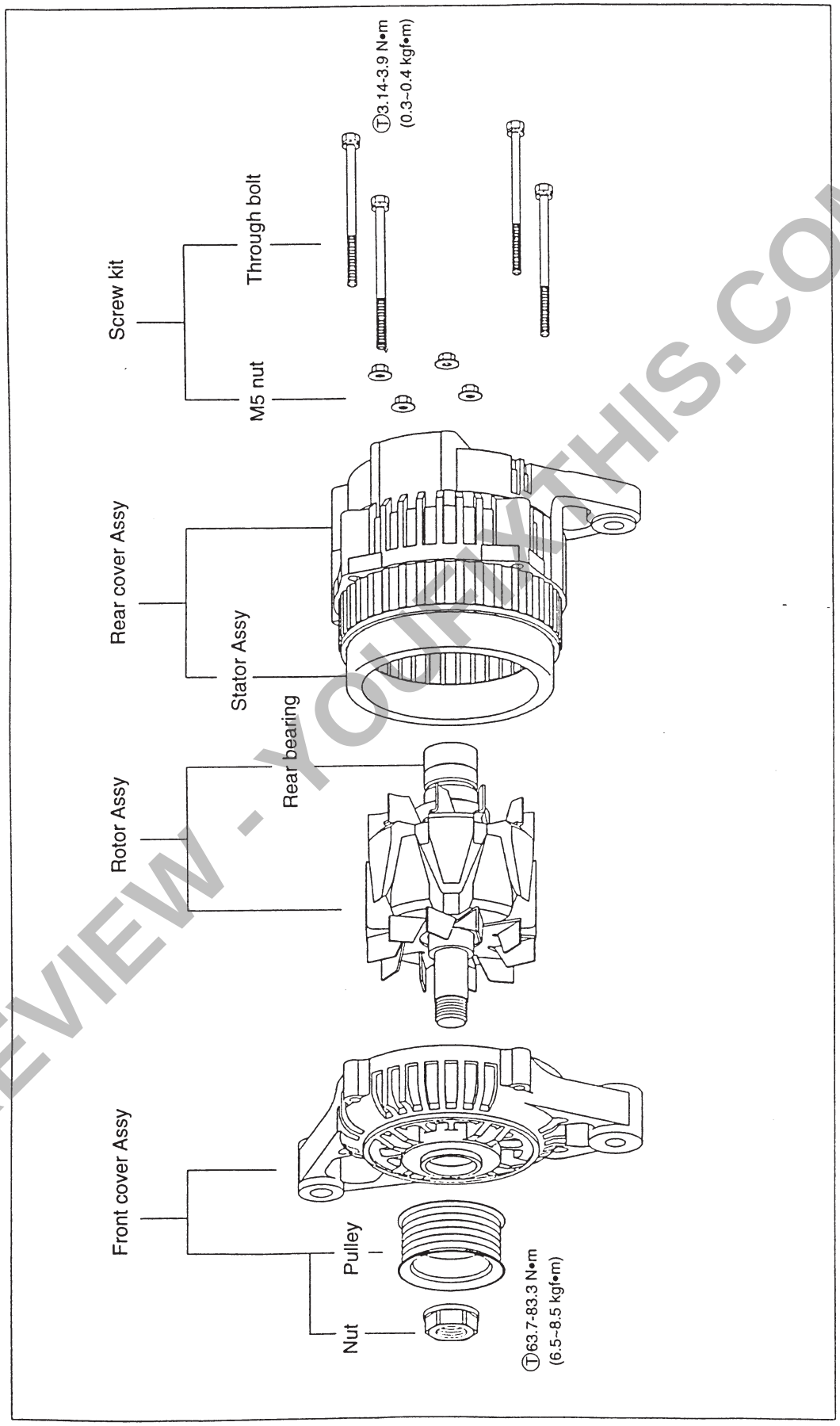
Part	Thread diameter	Tightening torque	
		kgf•cm	N•m
Turbine housing set bolt	M8	285±10	28±1
Compressor housing set bolt	M5	48±5	4.7±0.5
Thrust bearing set screw	M3	13±1	1.3±0.1
Seal plate set screw	M3	13±1	1.3±0.1
Blower impeller set nut (left-handed screw)	M5	20±2	2.0±0.2

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10.2.2 Exploded View



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(Unit: liter)

Model	Total volume (L)	Effective volume (L)
3TNV82A	5.5	1.9
3TNV84 (T)•88	6.7	2.8
4TNV84 (T)•88	7.4	3.4
4TNV94L98•(T)	10.5	4.5
4TNV106 (T) (CL class)	14.0	9.0
4TNV106 (T) (VM class)	14.0	7.5

Lube oil capacity may differ from the above volume depending on an engine installed on a machine unit.

(b)Replenishing oil pan with lube oil

If the remaining engine oil level is low, fill the oil pan with the specified engine oil to the specified level through the filler port.

[NOTICE]

The oil should not be overfilled to exceed the upper limit line. Otherwise a naturally-aspirated engine may intake lube oil in the combustion chamber during the operation, then white smoke, oil hummer or urgent rotation may occur, because the blowby gas is reduced in the suction air flow.

In case of turbo-charged engine oil may jet out from the breather or the engine may become faulty.

(4) Coolant water inspection

Daily inspection of coolant water should be done only by Coolant recovery tank.

⚠ CAUTION



- Never open the radiator filler cap while the engine and radiator are still hot. Steam and hot water will spurt out and seriously burn you. Wait until the radiator is cooled down after the engine has stopped, wrap the filler cap with a rag piece and turn the cap slowly to gently release the pressure inside the radiator.
- Securely tighten the filler cap after checking the radiator. Steam can spurt out during operation, if the cap is tightened loosely.

(a)Checking coolant water volume

Check the coolant water level in the Coolant recovery tank. If the water level is close to the LOW mark, open the Coolant recovery tank cap and replenish the Coolant recovery tank with clean soft water to the FULL mark.

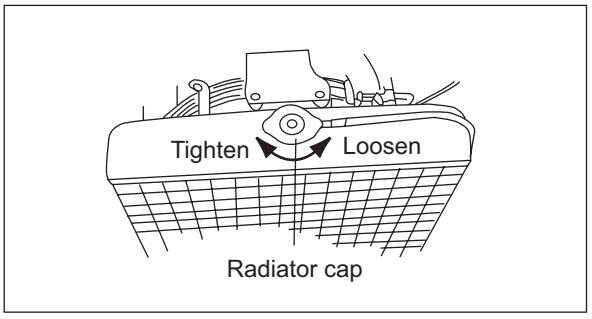
Standard

The water level of the Coolant recovery tank shall be between the upper and lower limit lines.

(b)Replenishing engine with water

If the Coolant recovery tank water level is lower than the LOW mark, open the radiator cap and check the coolant water level in the radiator. Replenish the radiator with the coolant water, if the level is low.

- Check the coolant water level while the engine is cool.
  Checking when the engine is hot is dangerous. And the water volume is expanded due to the heat.
- Daily coolant water level check and replenishing shall be done only at the Coolant recovery tank. Usually do not open the radiator cap to check or replenish.



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4.3.4 Servicing points

Point1

[Disassemble]

- Remove the crankshaft pulley using a gear puller after removing the crankshaft pulley set bolt. When removing the pulley using the gear puller, use a pad and carefully operate so as not to damage the thread. Set the gear puller securely to prevent the pulley from being damaged.

[Reassemble]

- Apply lithium grease to the oil seal lips. For the oil seal with double lips dust seal, further slightly apply engine oil on the lips so as not to damage them.
- Clean by wiping off any oil on both taper surfaces using detergent.
- Be sure to use the crankshaft pulley installing tool so as not to damage the oil seal lips. (See 4.3(6) Oil seal replacement)
- When installing the crankshaft pulley, apply lube oil to the set bolt to tighten and carefully assemble so as not to damage the oil seal.

N•m (kgf•m)

Model	Tightening torque
3TNV82A to TNV88	112.7 to 122.7 (11.5 to 12.5)
4TNV94L/98/106(T)	107.9 to 127.5 (11.0 to 3.0)

Point2

[Reassemble]

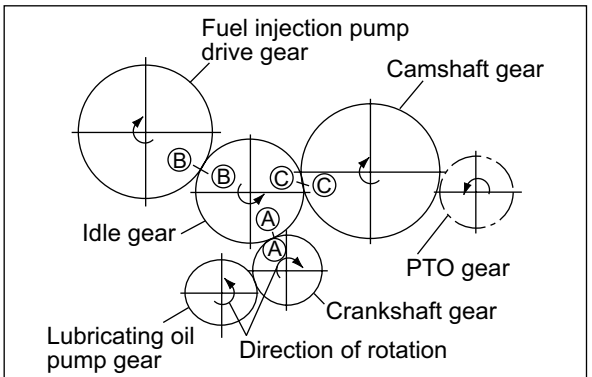
- When installing the gear case, do not forget to install the two reinforcing bolts at the center.
- Measure the backlash of each gear.

mm

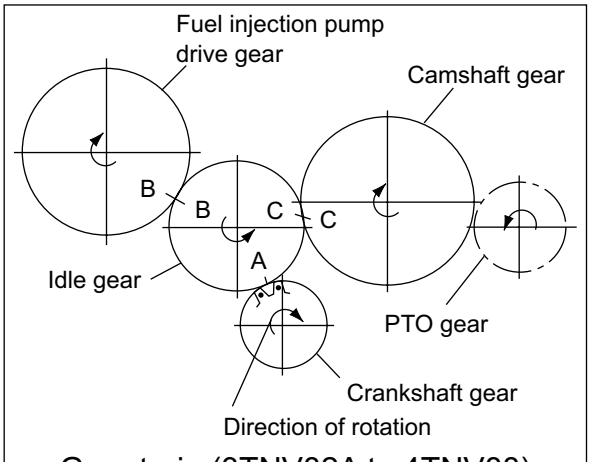
3TNV82A to 88	Standard	Limit
Crankshaft gear, Camshaft gear, Fuel injection pump gear, Idle gear, PTO gear,	0.07 to 0.15	0.17

4TNV94L-106(T)	Standard	Limit
Crankshaft gear, Camshaft gear, Fuel injection pump gear, Idle gear, PTO gear,	0.08 to 0.14	0.16
Balancer gear (only 4TNV106(T))	0.12 to 0.18	0.20
Lubricating oil pump gear	0.09 to 0.15	0.17

- Apply sealant and install the gear case by correctly positioning the two dowel pins.



Gear train (4TNV94L to 106)



Gear train (3TNV82A to 4TNV88)

(R.1)

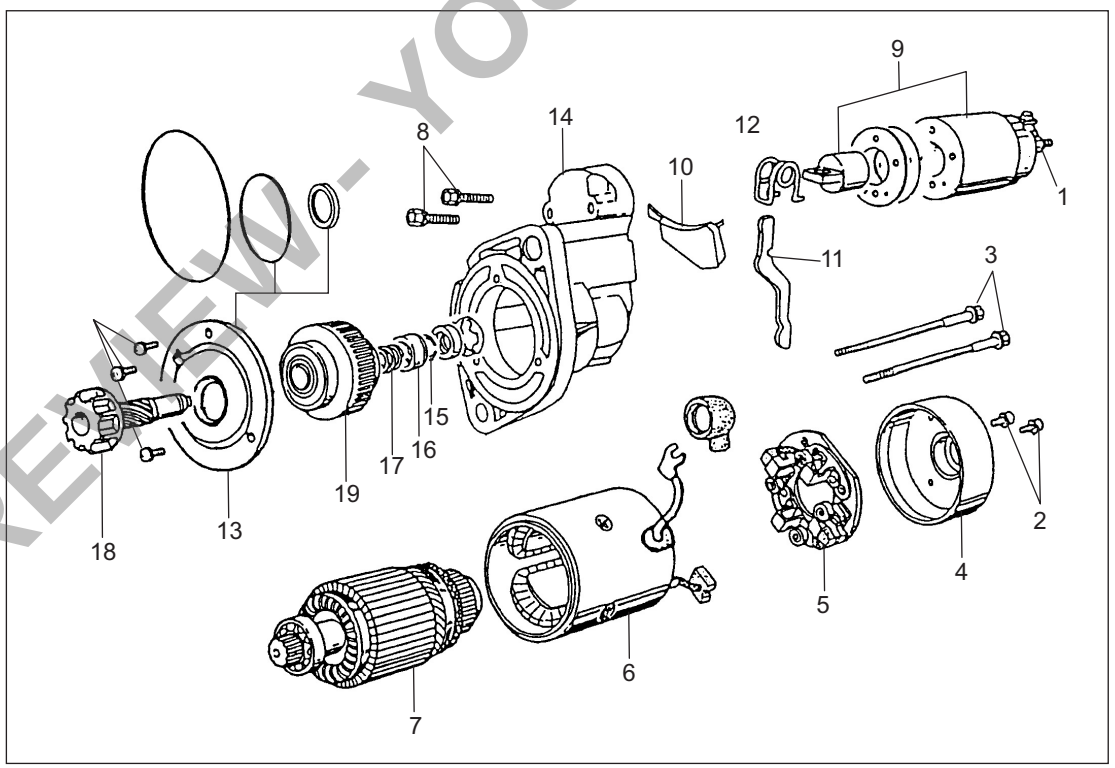
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9.1.4 Names of parts and disassembly procedure

(1) Disassembling order

1)Nut M8 (Disconnect the connecting wire.) ····· See the disassembly drawing.
2)Screw M4 (2)
3)Through bolt M5 (2)
4)Rear cover
5)Brush holder
6)Yoke assy.
7)Armature
8)Bolt M6 (2)
9)Magnetic switch
10)Dust cover
11)Shift lever
12)Screw M4 (3)
13)Bearing retainer
14)Gear case
15)Pinion stopper clip
16)Pinion stopper
17)Return spring
18)Pinion shaft
19)Clutch assy.

Disassembly drawing



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